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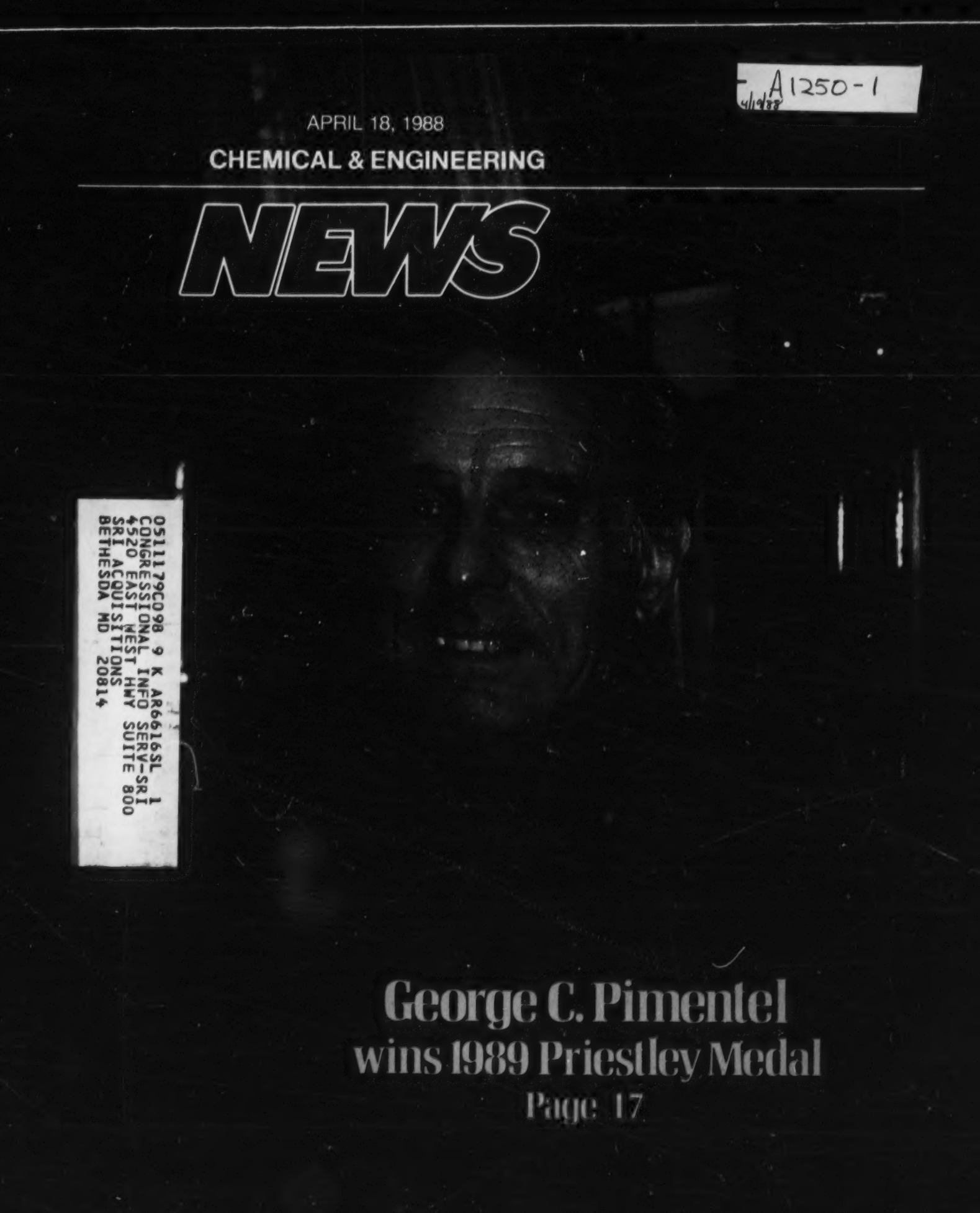
CHEMICAL & ENGINEERING

NEWS



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George C. Pimentel wins 1989 Priestley Medal

Page 17

CHEMICAL & ENGINEERING
NEWS
APRIL 18, 1988

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News of the Week

■ **Soviet health officials visit U.S. in attempt to finally put to rest continuing questions about a 1979 anthrax outbreak, maintaining that it was caused by tainted meat and not an accidental release from a suspected biological warfare facility.** **Page 4**

■ **U.S. producers of styrofoam plates, bowls, and fast-food containers will stop using fully halogenated chlorofluorocarbons by year's end.** **Page 5**

■ **Two-pronged program—a mobil exhibition and teams of speakers—aimed at enhancing the image of chemistry to the public has been launched by the U.K.'s Chemical Industries Association.** **Page 5**

■ **Possible use of criminal sanctions against scientific fraud, suggested at recent Congressional hearings on cheating in research, drew strong protests from researchers.** **Page 6**

■ **Joint venture to make PVC and formation of a consortium of U.S. firms to promote trade between the U.S. and the Soviets are the outgrowth of recent Moscow trade talks.** **Page 6**

Cover: Photo by C&EN's Rudy M. Baum

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Business

Vista Chemical is striving to expand its business in Europe, sees markets there contributing significantly to its sales this year. **Page 9**

Government

Chemists applying for funds from NSF are more likely to seek them from NSF divisions other than the chemistry division, a survey shows. **Page 14**

Technology

A microelectronic chemical sensor that can detect several kinds of hazardous gases has been developed by researchers at Sandia National Laboratories. **Page 21**

Method that uses urea to remove nitrogen oxides from flue gas shows promise as cost-effective route to reduce atmospheric pollution. **Page 22**

Books

"Knowing Everything About Nothing" by John Ziman offers practical advice to scientists who are considering career changes. **Page 23**

ACS News

Energy research funding, basic research support at NSF, and federal employment practices are issues of concern to chemists addressed by ACS recently in letters to several Congressional committees. **Page 25**

Priestley Medal

A quintessential basic researcher and a leader in chemical education and in the chemistry profession, George C. Pimentel, professor of chemistry at the University of California, Berkeley, is the 1989 recipient of ACS's Priestley Medal. **Page 17**

Chemical & Engineering News

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LETTERS

CHEMICAL SAFETY

Nitroacyl halide instability

SIR: A recent report of a vigorous decomposition at 60 °C when 3-methoxy-2-nitrobenzoyl chloride was heated with copper (I) cyanide to form the acyl nitrile attributed this to thermal instability of the latter [Goodwin, B., *Chem. Brit.*, **23**, 1180 (1987)].

Available evidence suggests that the real cause was much more probably the well-documented low thermal stability of several nitroaryl acyl halides (both carbonyl and sulfonyl), particularly when the nitro group is adjacent to the acyl halide function, and the decomposition temperature would be expected to be lowered by presence of the copper salt.

In this case, however, there is the additional possibility of demethylation of the 3-methoxy group by traces of hydrogen chloride in the starting material, self-condensation of the resulting hydroxy-nitrobenzoyl chloride (with liberation of hydrogen chloride to keep the exothermic demethylation-condensation sequence going), eventually leading to violent decomposition of the poly (nitroester). This sequence was established in detail for the isomeric 4-methoxy-3-nitrobenzoyl chloride, which in temporary storage at 100 °C led to violent decomposition at over 350 °C and a double explosion involving the chloromethane liberated by demethylation [Grewer, T., *Chem. Ing. Tech.*, **49**, 962 (1977)]. Again, copper salts would catalyze some of the reactions involved in the recent incident.

L. Bretherick
Bridport, Dorset, U.K.

Herbicide development clarified

SIR: I wish to clarify the statement (C&EN, March 7, page 24) about my involvement with Monsanto's herbicide Roundup. My group did not develop the product, although I certainly wish we had. Rather, our group developed key catalytic technology used in its manufacture.

James F. Roth
Allentown, Pa.

Plastic handguns

SIR: In the letter on plastic handguns (C&EN, March 7, page 4) Alan Nixon makes two points. One clearly proves that the other is not valid. Specifically, he pleads the case for C&EN to speak out in areas not confined to the fields normally a formal part of ACS or C&EN. He cites as an example the so-called plastic gun. Clearly this shows why we must be careful to stay in our areas of professional expertise. Even a superficial investigation of the facts will show there is no such thing as a plastic gun, nor is current materials science likely to make one possible in the foreseeable future.

The required strength of a plastic to withstand the fast burning of the propellent of a modern cartridge is far beyond any existing plastic. What the anti-gun forces call a "plastic gun" is simply a rather standard handgun with grips and body of a high-grade polymer. The barrel, springs, firing pin, and indeed most of the weapon is of standard steel components. Further numerous tests with standard airport security x-ray equipment prove even disassembled it clearly is seen as a weapon by properly trained and attentive security personnel. The problem of airport security is not mythical plastic guns, but poor training and lax enforcement—as recent Federal Aviation Administration trials have shown.

Given the obvious lack of factual basis for Nixon's concern about plastic guns, I submit this is a perfect example of why we should stay within our professional area as far as C&EN is concerned. Certainly as a citizen any member can and should become involved in political questions of interest. I hope this fine technical publication will not become diluted as a political forum.

Jack Jacox
Columbus, Ohio

Hazards of environmentalism

SIR: The comments by Richard K. Long (C&EN, March 14, page 3) on the image of chemicals may represent an appropriate and advantageous short-term strategy for Dow's director of corporate communications speaking to the Public Relations Society of America.

But he may also be confusing temporary illusion and deception with reality, and he may misunderstand or misinterpret virtually everything about the nature of modern environmentalism, including inherent hazards.

One of the illusions that Long accepts is, "Much of the public considers clean

NSF Probes Applicants' Perception Of Proposal Review System

Survey shows chemists are less likely to seek funding only from their own NSF division; most rejectees felt proposal turndowns were fair

In fiscal 1985, 9% of the 14,000 proposals acted on by the National Science Foundation came from academic individual investigators who defined their primary field of research as chemistry. These chemists were less likely than other scientists, except physicists, to seek support only from their own (chemistry) division; just under 60% of their proposals went to the chemistry division.

Yet 90% of the 799 proposals acted on by the chemistry division came from chemists. Physicists, biochemists, and chemical engineers accounted for another 6% of the proposals. More than 29% of the applicants to the chemistry division define themselves as consistent rejectees having had two or more of the proposals they submitted to NSF over five years turned down. However, the majority felt that the decision to decline their proposal was "fair." Chemistry division applicants also are much more likely than other applicants to submit a declined proposal to another agency for funding; 22% of them preferred the National Institutes of Health as a source of funding.

These are just a few of the facts to be gleaned from a new report, "Proposal Review at NSF: Perceptions of Principal Investigators." The report presents the results of a survey conducted by NSF in late 1986 of more than 14,000 applicants from academic institutions whose proposals for research support had been awarded or declined during fiscal year 1985. About 88% of survey recipients who received grants in fiscal 1985 responded, as did 52% of those whose proposals had been declined. Altogether, more than two thirds of those surveyed responded.

For the foundation as a whole, 34% of the proposals from the surveyed population were awarded. The rates varied from a high of just under 60% for atmospheric sciences to a low of about 15% for research initiation and improvement. The

Chemists more apt to seek funds from other NSF divisions

Number of proposals	Biochemistry	Chemical engineering	Chemistry	Mathematics	Materials research	Physics
Biological, behavioral, and social sciences	373	9	139	45	18	24
Behavioral, neural sciences	31		30	4	6	5
Biotic systems, resources	3		8	1		
Cellular biosciences		2	2	27	10	6
Molecular biosciences	339	6	99		2	10
Social, economic sciences		1		13		3
Computer and information science & engineering	0	2	0	21	0	17
Computer research		2		16		
Information science, technology				5		17
Engineering	7	349	65	24	14	47
Chemical, biochemical, thermal	3	304	34	2	2	
Design, manufacturing		1		1		
Electrical, communications, and systems	2		11	12		2
Emerging and critical systems		5	2	2	3	30
Mechanics, structures, and materials		9	6	7	9	8
Other	2	30	12			7
Geosciences	6	0	31	2	1	83
Atmospheric sciences			13	2		57
Polar programs			5			16
Earth sciences	3		9		1	5
Ocean sciences	3		4			5
Mathematical and physical sciences	17	20	844	974	147	529
Astronomical sciences						16
Chemistry	13	11	720	3	2	22
Materials research	2	6	115	3	143	248
Mathematics	2	1	1	966		8
Physics			8	2	2	235
Research initiation, improvement	13	18	27	23	8	8
Other[a]	68	29	153	60	16	63
TOTAL	484	427	1259	1149	204	771

a Program or division not reported or identified. **Source:** National Science Foundation

rate for chemistry was about 38%, materials research 35%, and chemical engineering 30%.

When asked their opinion of NSF's proposal review system, 80% of the awardees and 33% of those whose proposals were declined said they were satisfied with it. However, half of the rejectees, and some of the awardees, were dissatisfied with the process. A minority of the applicants described their feelings as "neutral." Those who didn't like the process came up with a number of reasons for their dissatisfaction. According to the report, young investigators were more likely to cite cursory reviews, and older investigators more likely to say that some reviewers had the wrong scientific background or were poorly chosen by the program officer. Dissatisfied applicants, primarily from undergraduate institutions, were more likely to cite bias toward big schools and politics and cronyism as sources of their dissatisfaction.

The survey also showed that investigators who wrote, telephoned, or visited a program officer before submitting a proposal were somewhat more likely to be funded than those who had not. The report notes that the survey did not address the reasons for this outcome, but experience shows that in many cases investigators decide not to submit a proposal after making contact with NSF. In other cases they are able to sharpen the proposal. The likelihood of an award also was much higher for applicants who said they knew the program officer prior to submitting an application.

Other results of the survey, according to the report, include:

- 75% of all applicants, and 97% of the consistently successful ones, had served as a reviewer or panelist for NSF at least once in the five years before the survey.
- For 29% of the applicants (51% of the women), the proposal that was the object of the survey was the first they had submitted to NSF as an independent private investigator.
- 20% of applicants were competing for further funding of current NSF-supported work, whereas 80%, some of whom had current NSF funding, said their proposal was for new work.
- 29% indicated that their proposal was for new work.
- 13% of the proposals were for less than $30,000, and 7% were for more than $150,000.
- The average elapsed time between proposal submittal and a decision was 7.4 months.
- 76% of the proposals were reviewed by mail and 42% by a panel; 16% didn't know how their proposals were reviewed.

Copies of the report can be obtained from the Forms and Publications Unit, Room 232, National Science Foundation, 1800 G St., N.W., Washington, D.C. 29550. Request NSF 88-4.

Janice Long, Washington

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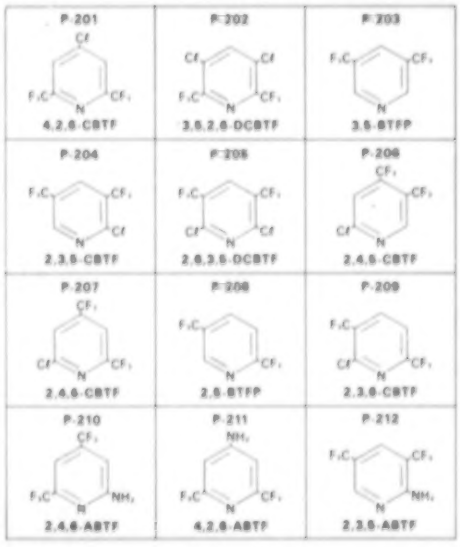

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